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# Introductions

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Executive Director

California Building Standards Commission

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Community Development



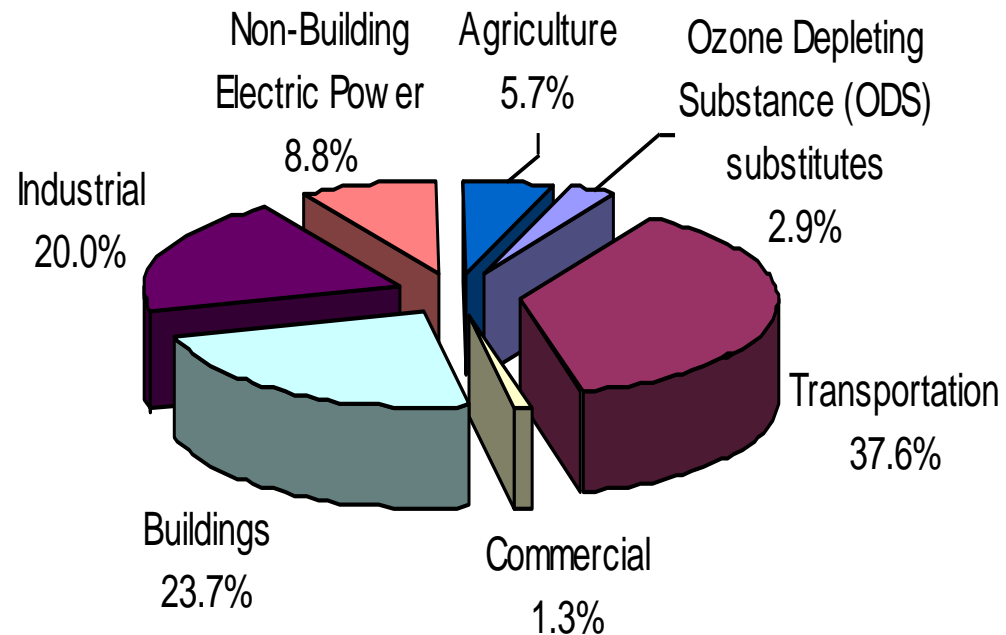
# Today's Objectives

- **Why a CALGreen Code**
- **How the CALGreen Code was developed**
  - Rulemaking process
  - Transparency of process
  - Support for CALGreen
- **Overview of Residential and Non-Residential Code Provisions**

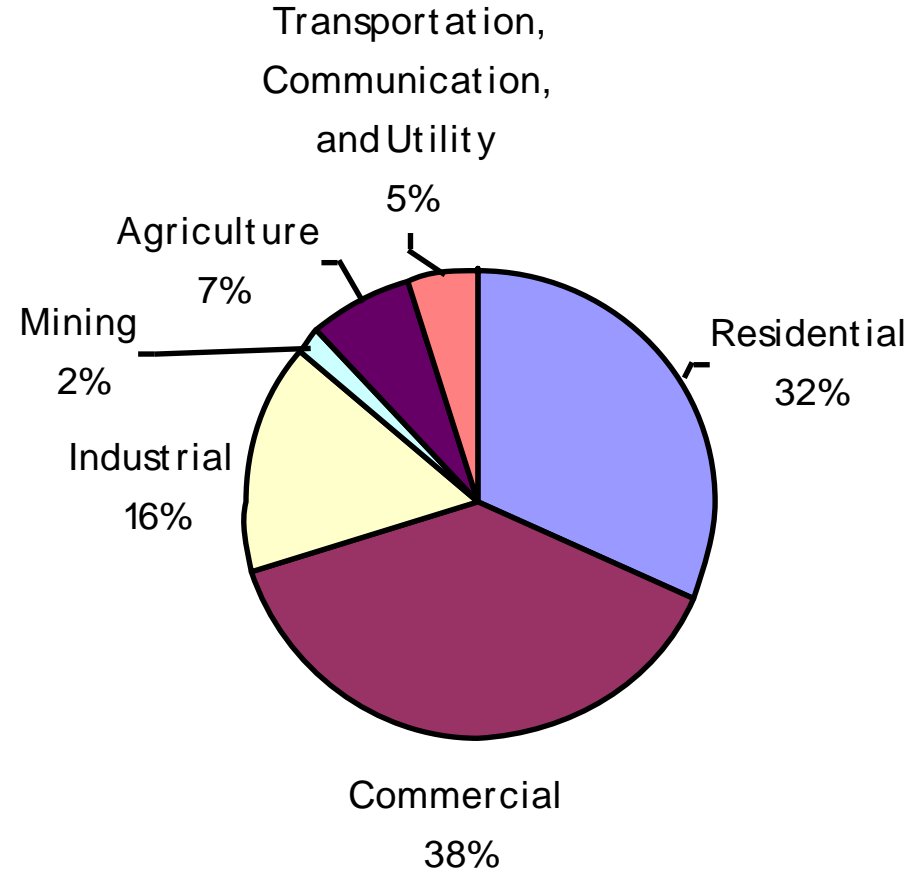
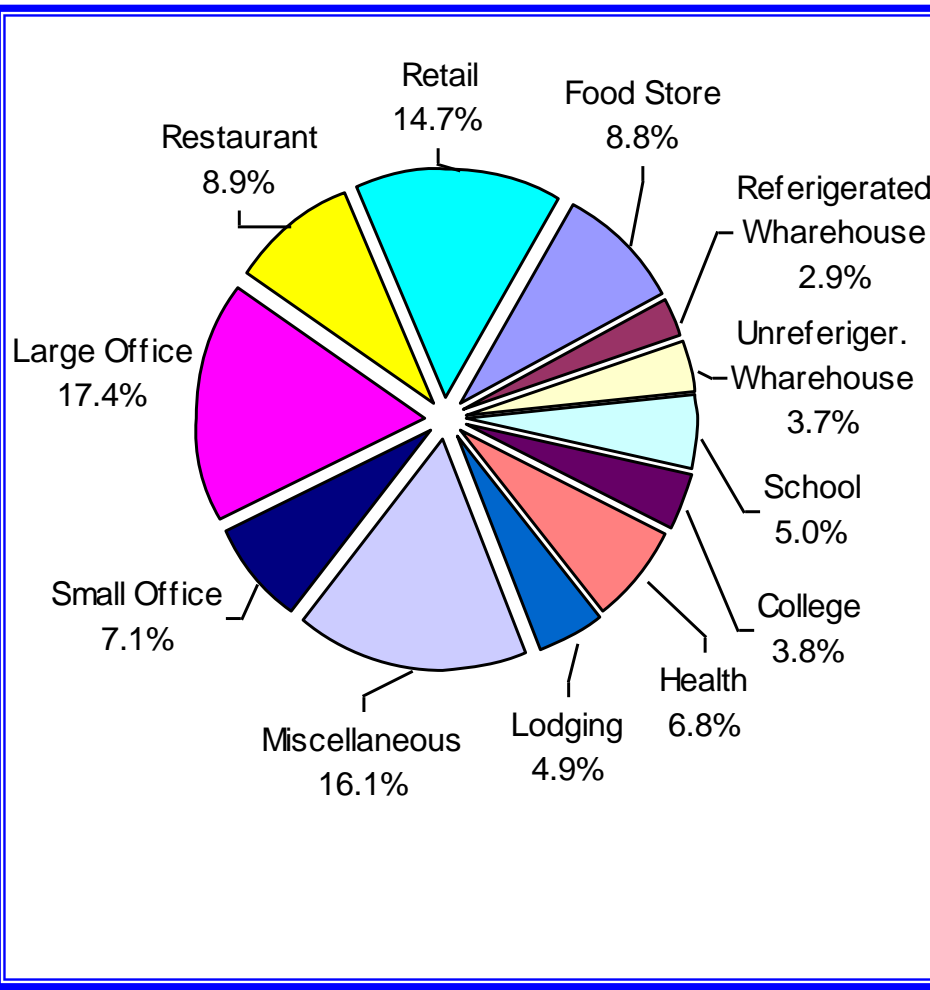
# California Green Building Initiative & Global Warming Solutions Act of 2006 (EO S-20-04 & AB32)

- Buildings are 2nd largest contributor (23.7%) to GHG emissions
- EO S-20-04: Reduce grid-based electricity by 20% in state-owned buildings by 2015; reduce associated greenhouse gas emissions
- AB 32: Reduce GHG emissions to 1990 levels by 2020

California GHG Emissions



# Energy Use in California



# Water Use in California

## Executive Order S-06-08

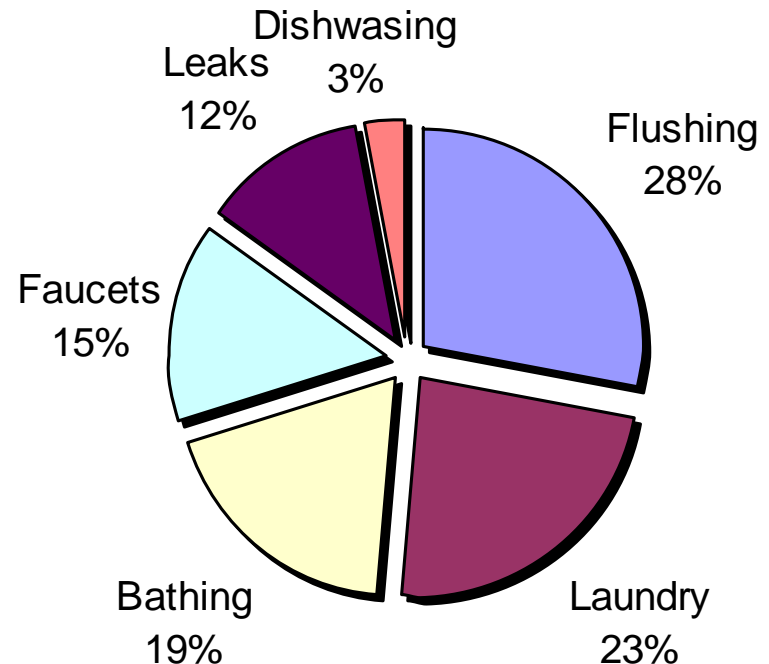
## Governor's 2009 Proclamation

Water-related uses account for 19% of California's electricity, 30% of its natural gas and 88 billion gallons of diesel fuel every year.

Water-efficiency measures can reduce water and sewer costs by up to **30 percent**.

Significant savings in energy, chemical and maintenance expenses typically follow.

SOURCE - USGS



## Typical Residential Water Use (Indoor use)

**50 to 300 gpcd – landscape 50%**

Source - Water Education Foundation

# Why CALGreen

## Uniformity and Consistency

- ❑ Jurisdictions adopting many different programs
- ❑ Works with other California codes

## ■ Governor's Directive

# Adopting State Agencies

- ❑ The Department of Housing and Community Development (HCD)
- ❑ Division of the State Architect (DSA)
- ❑ Office of Statewide Health Planning and Development (OSHPD)
- ❑ California Building Standards Commission (CBSC)



# California Building Standards Commission



- Independent Commission
- State and Consumer Services Agency

# California Building Standards Commission

## ■ Chair

- Secretary of the State and Consumer Services Agency

## ■ Commissioners (10)

- Appointees specified by law
  - One architect
  - One mechanical, electrical or fire protection engineer
  - One structural engineer
  - One licensed contractor
  - Three public members, at least one must be a person with disabilities
  - One member from organized labor in the building trades
  - One local building official
  - One local fire official
- At least one member knowledgeable in barrier-free architecture
- At least one member knowledgeable in energy efficiency standards

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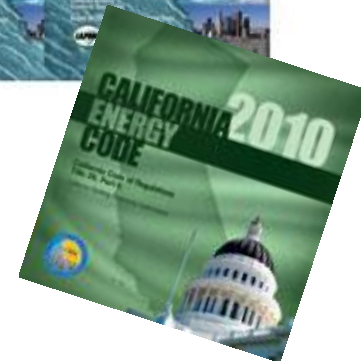
# CBSC Responsibilities

- Review building standards proposed by state agencies
- Develop building standards for occupancies where no other state agency has the authority - non-residential
- Adopt and approve building standards for publication
- File approved building standards with the Secretary of State
- Codify approved building standards
- Contract to publish the California Building Standards Code
- Act as the state depository for local government modifications

# 2010 California Building Standards Code – Title 24

(effective January 1, 2011)

- ❑ Part 1 - California Administrative Code
- ❑ Part 2 - California Building Code
- ❑ Part 2.5 California Residential Code
- ❑ Part 3 - California Electrical Code
- ❑ Part 4 - California Mechanical Code
- ❑ Part 5 - California Plumbing Code
- ❑ Part 6 - California Energy Code
- ❑ *Part 7 - Vacant*
- ❑ Part 8 - California Historical Building Code
- ❑ Part 9 - California Fire Code
- ❑ Part 10 - California Existing Building Code
- ❑ **Part 11 - California Green Building Standards Code**
- ❑ Part 12 - California Referenced Standards Code



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## • **Development Process of CALGreen**

- ❑ CBSC's and HCD's Stakeholder Green Building Focus Group
  - ❑ Building officials
  - ❑ Representatives from the construction industry
  - ❑ Representatives from model code writing bodies
  - ❑ Representatives from the environmental community
  - ❑ Representatives from point rating programs
  - ❑ State agency representatives
  - ❑ Public members

# Contributing State Agencies

- ❑ Air Resources Board
- ❑ California Integrated Waste Management Board (CalRecycle)
- ❑ Department of General Services
- ❑ Department of Water Resources
- ❑ Energy Resources Conservation and Development Commission (Energy Commission)
- ❑ Department of Public Health

# Additional resources utilized in developing California Green Building Standards Code

- ❑ Collaborative for High Performance Schools (CHPS)
- ❑ California Green Builder
- ❑ Leadership in Energy and Environmental Design (LEED)
- ❑ Green Globes
- ❑ Scottsdale Arizona Checklist
- ❑ Build It Green
- ❑ UC Berkeley Green Building Baseline
- ❑ Draft ASHRAE Standard 189P

# **Building Standards Formal Adoption Process Administration Procedure Act**

- **Code Advisory Committees**
- **Public Comment Period**
  - 45 day and 15 Day
- **Public Hearings**
  - If requested
- **Commission Meeting**
  - Public comments



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# California Green Building Standards Code

- **Initial Voluntary Standards**
  - Effective August 1, 2009
- **City and County Adoption**
- **2010 Mandatory Standards**
  - Effective January 1, 2011
- **Next Adoption Cycle**

# Support for CALGreen

- Laborers International

**LiUNA!**

*Feel the Power*



- AIACC

- NRDC

- CAL Chamber

- EDF

- CBPA



California  
Business  
Properties  
Association



**NAIOP**  
COMMERCIAL REAL ESTATE  
DEVELOPMENT ASSOCIATION  
NAIOP OF CALIFORNIA

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# California Department of Housing and Community Development



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# California Department of Housing and Community Development

## Three Divisions

### Division of Financial Assistance

Administers more than 20 programs awarding loans and grants to hundreds of local public agencies, private nonprofit and for-profit housing developers, and service providers every year. This money supports the construction, acquisition, rehabilitation and preservation of affordable rental and ownership housing, child care facilities, homeless shelters and transitional housing, public facilities and infrastructure, and the development of jobs for low income workers.

### Division of Housing Policy Development

Provides leadership, policies and programs to preserve and expand safe and affordable housing opportunities and promotes strong communities for all Californians.

### Division of Codes and Standards

Administers the following seven programs:

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# California Department of Housing and Community Development

## Occupational Licensing

Enforces State laws and regulations governing the sale or lease of manufactured homes, mobilehomes, and/or commercial coaches, including the licensing of manufacturers, distributors, dealers, and salespersons. The program also performs functions on behalf of the Mobilehome Ombudsman related to investigating and resolving consumer complaints pertaining to manufactured housing.

## Registration and Titling

Maintains title and registration records and collects fees and taxes on manufactured homes, mobilehomes, commercial modulars, floating homes, and truck campers.

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# California Department of Housing and Community Development

## Factory Built Housing

Promotes preemptive regulations establishing construction standards for factory-built homes and factory-built building components manufactured for sale or use within the State. Inspections are conducted and complying homes or components are issued a Department Insignia of Approval.

## Manufactured Housing

Assists with the development and enforcement of preemptive federal and state regulations establishing minimum design and construction standards for manufactured homes, multi-unit manufactured housing, commercial coaches and special purpose commercial coaches sold, offered for sale, rented, or leased within the State. Inspections are conducted and the Department Insignias of Approval are issued to indicate compliance.

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# California Department of Housing and Community Development



## Mobilehome Parks

Promulgates preemptive statewide regulations for the construction, use, maintenance and occupancy of all privately-owned mobilehome and special occupancy parks in the State, as well as the installation of manufactured homes and mobilehomes both in and outside of parks. Directly, or through local governments, inspects and issues permits for park operation.



## Employee Housing Program

Promulgates statewide regulations for the maintenance, use, and occupancy of privately-owned and operated employee housing facilities providing housing for five or more employees to assure their health, safety, and general welfare. Directly, or through local governments, inspects and issues permits for facility operation.

# California Department of Housing and Community Development

## State Housing Law

The SHL was enacted to protect the health, safety and general welfare of the public and occupants of dwelling units in the State of California. Under this authority, HCD promulgates building standards and regulations to ensure that hotels, motel, apartments, single-family dwellings, and other residential buildings are constructed and maintained in compliance with the model building codes and other provisions of State law.



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# California Department of Housing and Community Development



HCD Authority  
Hotels, Motels  
Apartment Houses  
Dwellings  
Lodging Houses  
Homeless Shelters



**Includes**  
**High Rise**

Monasteries, Convents  
Employee Housing  
Factory-Built Housing

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# California Green Building Standards Code



## Overview



# The Code Of Hammurabi

- The Code Of Hammurabi (1760 BC) contained 282 laws including some which covered building construction.
- If a builder build a house for some one, and does not construct it properly, and the house which he built fall in and kill its owner, then that builder shall be put to death.
- If it ruin goods, he shall make compensation for all that has been ruined, and inasmuch as he did not construct properly this house which he built and it fell, he shall re-erect the house from his own means.
- If a builder build a house for some one, even though he has not yet completed it; if then the walls seem toppling, the builder must make the walls solid from his own means.

# What is CALGreen

- It is a statewide mandatory construction code
- It is not the same as a rating system or point based program
- It is statutorily enforced by local enforcing agencies
- It does not require outside inspection, review or certification by any entity other than the enforcing agencies
- It preserves local ability to make enhancements or modifications
- A word about comparisons and confusion

# Code Format

- Chapter 1 Administration
- Chapter 2 Definitions
- Chapter 3 Green Building
- Chapter 4 Residential Mandatory Measures
- Chapter 5 Nonresidential Mandatory Measures
- Chapter 6 Reference Organizations and Standards
- Chapter 7 Installer and Special Inspector Qualifications
- Chapter 8 Compliance Forms and Worksheets
- Appendix A4
- Appendix A5

# California Green Building Standards Code

## ■ Chapter 1 Administration

- Purpose
  - Minimize impact of construction and improve construction practices
- Scope
  - New construction
  - Low-rise residential
- Local amendments based on findings
  - Climate
  - Topography
  - Geology
- Alternate Materials and Methods
- Construction Documents
- Application and State Agency Authorities

# California Green Building Standards Code

## ■ Chapter 2 Definitions

- ❑ If used in more than one location in the code a defined term will be located in Chapter 2
- ❑ If only used in one chapter the defined term will be located in the definition section at the beginning of that chapter
- ❑ Banners will tell which agency adopts
  - **CONDITIONED FLOOR AREA. [BSC, HCD]**

# California Green Building Standards Code

## ■ Chapter 3 Green Building

### □ Scope

#### ■ Newly constructed buildings

### □ Mixed Occupancy Buildings

#### ■ Shall comply with appropriate requirements for each separate occupancy type

### □ Phased Projects

### □ Voluntary Tiers

#### ■ Tier 1 and Tier 2



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# California Department of Housing and Community Development

## Chapter 4 – Residential Mandatory Measures

# Chapter 4 – Residential Mandatory Measures

## Five Divisions

- 🏠 Division 4.1 - Planning and Design
- 🏠 Division 4.2 - Energy Efficiency
- 🏠 Division 4.3 - Water Efficiency and Conservation
- 🏠 Division 4.4 - Material Conservation and Resource Efficiency
- 🏠 Division 4.5 - Environmental Quality



# Chapter 4 – Residential Mandatory Measures

## Division 4.1 - Planning and Design

# Chapter 4 – Residential Mandatory Measures

## § 4.106.2 Storm water drainage and retention.

- Construction projects less than one acre are outside the scope of the California State Water Resources Control Board (SWRCB).
- Will help prevent flooding of adjacent property and prevent pollution from storm water runoff by retaining soil on-site or by providing filtering to restrict sedimentation from reaching storm water drainage systems and receiving streams or rivers.
- Establishes criteria for a plan to manage storm water drainage during construction.

# Chapter 4 – Residential Mandatory Measures

## How to comply

### *§ 4.106.2 Storm water drainage and retention.*

- *Retention basin sized and shown on the site plan.*
- *Filtering storm water and routing to a public drainage system.*
- *Compliance with local storm water ordinance.*

# Chapter 4 – Residential Mandatory Measures

## § 4.106.3 Surface Drainage.

- Requires planning of the surface drainage system that will serve the site.
- Requires the construction plans to indicate how surface drainage will be managed.

# Chapter 4 – Residential Mandatory Measures

## How to comply

### § 4.106.3 Storm water drainage and retention.

- Drainage system is shown on site plan.
  - Swales
  - Drain piping
  - Retention areas
  - Ground water recharge

# Chapter 4 – Residential Mandatory Measures

## Division 4.2 – Energy Efficiency



# Chapter 4 – Residential Mandatory Measures

## Energy Efficiency

### § 4.201.1 Minimum Energy Performance for Low-Rise Residential Buildings.

- The California Energy Commission (CEC) adopts regulations to establish the minimum level of energy efficiency a heated or cooled structure must meet or exceed.

# Chapter 4 – Residential Mandatory Measures

## How to comply

### § 4.201.1 Energy Efficiency.

- *Prescriptive Method*
- *Performance Method*
- *Tiers*
  - *Performance calculation can show percentages above minimum*

# Chapter 4 – Residential Mandatory Measures

## Division 4.3 – Water Efficiency and Conservation

# Chapter 4 – Residential Mandatory Measures

## § 4.303.1 20% Water savings.

- Requires a 20% reduction of indoor water use.
- Provides a prescriptive and performance method.

Mandatory effective date for  
20% reduction is July 1, 2011

Concerns over availability of fixtures and performance

# Chapter 4 – Residential Mandatory Measures

## *How to comply method #1*

### *§ 4.303.1 20% Indoor Water savings.*

#### ➤ *Prescriptive Method*

##### ➤ *Table 4.303.2*

- *Showerheads  $\leq 2.0$  gpm @ 80 psi*
- *Lavatory Faucets  $\leq 1.5$  gpm @ 60 psi*
- *Kitchen Faucets  $\leq 1.8$  gpm @ 60 psi*
- *Urinals  $\leq .5$  gal/flush*
- *Waterclosets  $\leq 1.28$  gallon effective flush rate*

# Chapter 4 – Residential Mandatory Measures

## *How to comply method #2*

### *§ 4.303.1 20% Indoor Water savings.*

#### ➤ *Performance Method*

- *Use the performance calculation worksheets in Chapter 8 or other calculation acceptable to the enforcing agency*
- *Fixtures used in performance calculation are limited*
  - *Water closets*
  - *Urinals*
  - *Lavatory Faucets*
  - *Showerheads*

# Chapter 4 – Residential Mandatory Measures

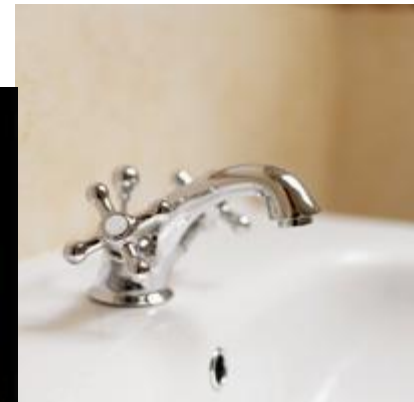
## § 4.303.2 Multiple Showerheads Serving One Shower.

- When using the prescriptive method, the sum of multiple showerheads shall not exceed the flow rate specified in Table 4.303.2.
- When using the performance method, the maximum flow rate for each shower head shall not exceed 2.5 gpm @ 80 psi.

# Chapter 4 – Residential Mandatory Measures

## § 4.303.3 Plumbing Fixtures and Fittings.

- Specifies acceptable performance standards for plumbing fixtures with reduced water usage.





# Chapter 4 – Residential Mandatory Measures

## How to comply

### § 4.303.3 *Plumbing Fixtures and Fittings.*

- *Install a fixture which meets the standards listed in Table 4.303.3.*
- *Obtain alternate approval from the enforcing agency for use of fixtures not listed.*

# Chapter 4 – Residential Mandatory Measures

## § 4.304.1 Irrigation Controllers.

- Requires irrigation controls to be weather- or soil moisture-based and automatically adjust irrigation in response to changes in plants' needs as weather conditions change, or have rain sensors or communication systems that account for local rainfall.



# Chapter 4 – Residential Mandatory Measures

## How to comply

### § 4.304.1 Irrigation Controllers.

- *Applies to controllers installed at time of final inspection*
- *Automatically delay watering cycle due to rain*
- *Can be communication based*
- *Can be based on plant watering needs*
- *Can be based on soil moisture*

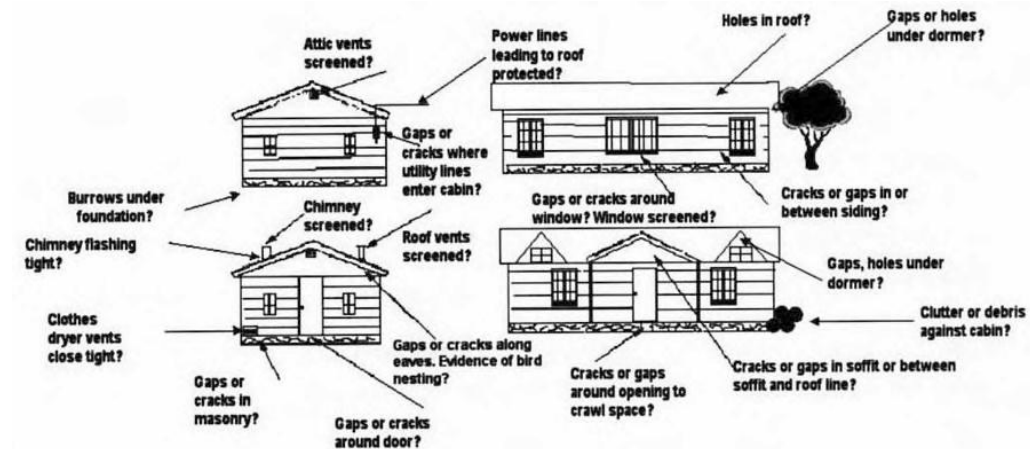
# **Chapter 4 – Residential Mandatory Measures**

## Division 4.4 – Material Conservation and Resource Efficiency

# Chapter 4 – Residential Mandatory Measures

## § 4.406.1 Joints and Openings.

- Establishes a requirement to fill spaces around pipes and other penetration in the building with materials that will prevent the passage of rodents.



# Chapter 4 – Residential Mandatory Measures

## How to comply

### § 4.406.1 Joints and Openings.

- *Use metal plates or covers*
- *Use cementitious material to seal opening*
- *Other methods approved by the enforcing agency*

# Chapter 4 – Residential Mandatory Measures

## § 4.408.1 through 4.408.2.2 Construction Waste Reduction, Disposal and Recycling.

- Requires at least of 50% of nonhazardous construction and demolition debris to be recycled and/or salvaged, or;
- Compliance with a local waste ordinance which is more stringent.
- Exceptions:
  - Soil and land clearing debris are exempt
  - Alternate methods or exceptions may be approved due to local constraints



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# Chapter 4 – Residential Mandatory Measures

## How to comply

*§ 4.408.1 through 4.408.2.2 Construction Waste Reduction, Disposal and Recycling.*

- *Comply with local waste management ordinance.*
- *Develop a waste management plan and submit for approval to the enforcing agency.*
- *Provide documentation of compliance.*
  - *HCD is developing additional forms.*
  - *Sample forms are provided in Chapter 8.*





# Chapter 4 – Residential Mandatory Measures

## § 4.410.1 Building Maintenance and Operation.

- Requires educational materials, operation and maintenance manuals are provided to ensure buildings and equipment are properly maintained.
  - As construction practices become more sophisticated, a certain level of knowledge is required to maintain building systems and equipment.
- Other information such as landscape design and maintenance, public transportation options, recycle opportunities, special inspection reports, and energy incentive programs.

# Chapter 4 – Residential Mandatory Measures

## How to comply

### § 4.410.1 Building Maintenance and Operation.

- *Develop a manual and place it in the home at the time of final inspection.*
  - *Media shall be approved by the enforcing agency.*
- *Utilize a web-based program to make the manual accessible.*
- *HCD is developing a sample standard format for the manual.*

# **Chapter 4 – Residential Mandatory Measures**

## Division 4.5 – Environmental Quality

# Chapter 4 – Residential Mandatory Measures

## § 4.503.1 Fireplaces.

- Requires gas fireplaces to be direct-vent, wood and pellet stoves to comply with EPA limits or comply with a local ordinance which is more or prohibitive.



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# Chapter 4 – Residential Mandatory Measures

## How to comply

### § 4.503.1 Fireplaces.

- *Install direct vent gas fireplaces.*
- *Install a pellet or wood stove which meets US EPA Phase II emission standards.*
- *Comply with local ordinance.*

# Chapter 4 – Residential Mandatory Measures

## § 4.504.1 Covering of Duct Openings and Protection of Mechanical Equipment During Construction.



- Requires duct openings, permanent mechanical equipment and other components that will be used to move air in the building after occupancy be protected from contamination during construction.
  - These systems are commonly used to condition the building during construction. Typically, they are not protected leading to a collection of dust and debris exposed to the circulated air within the structure.

# Chapter 4 – Residential Mandatory Measures

## How to comply

### § 4.504.1 Covering of Duct Openings and Protection of Mechanical Equipment During Construction.

- *Cover return and supply openings with plastic or sheetmetal.*
- *Wrap or protect equipment stored on the jobsite for future installation.*
- *If necessary plan for alternate space conditioning systems during construction.*

# Chapter 4 – Residential Mandatory Measures

## § 4.504.2 Finish Material Pollutant Control.

- Limits pollutants from the off-gassing of finish materials inside a residence.
- Tables are provided that establish limits on the emissions of VOCs in adhesives, paints, and other coatings.
- VOC limitations are also included for carpet, carpet cushions and carpet pad adhesives.



# Chapter 4 – Residential Mandatory Measures

## § 4.504.2 Finish Material Pollutant Control.

- A table addressing the formaldehyde limits was developed based on maximum allowable limits recently established by the California Air Resources Board (ARB).
- Ensures these levels are met by including a mandatory verification component which requires certification or documentation.

# Chapter 4 – Residential Mandatory Measures

## How to comply

### § 4.504.2 Finish Material Pollutant Control.

- *Collect material specification sheets and make them available at time of inspection.*
- *Product labels.*
- *Use the specification sheet HCD is developing as a compliance aid for this section.*

# Chapter 4 – Residential Mandatory Measures

## § 4.505.2 Concrete Slab Foundations.

- Provides explicit requirements for the installation of vapor barriers in slab on grade foundations to address moisture and mold issues that can negatively affect indoor air quality as well as damage floor coverings.
- Allows equivalent methods to be used provided the same protections will be maintained.

# Chapter 4 – Residential Mandatory Measures

## How to comply

### § 4.505.2 Finish Material Pollutant Control.

- *Follow the prescriptive requirements in this section.*
- *Obtain approval from the enforcing agency for an alternate design.*
- *Use the design specified by a licensed California architect or engineer.*
- Specifies an aggregate base of ½” or larger material must be used as a capillary break and clarifies that the vapor retarder must be placed above the aggregate and in direct contact with the concrete slab.

# Chapter 4 – Residential Mandatory Measures

## § 4.505.3 Moisture Content of Building Materials.

- Requires the moisture content of construction materials and insulation to be verified prior to approval to enclose wall and floor cavities with drywall or other finish surfaces.
- HCD currently adopts sections of the CBC which specify maximum grading and mill certification levels of moisture in framing materials. This section requires field verification and protection during wet weather.



# Chapter 4 – Residential Mandatory Measures

## How to comply

### § 4.505.3 Finish Material Pollutant Control.

- *Cover building materials to protect them from rain.*
- *Ensure the building is weather tight before insulating.*
- *Use other precautions necessary to ensure the building materials are kept dry.*
- *Test for moisture levels.*

# Chapter 4 – Residential Mandatory Measures

## § 4.506.1 Bathroom Exhaust Fans.

- Requires exhaust fans in any room which contains a bathtub or shower.
- Allows a whole house ventilation system designed to provide outside air to be used to comply with this section.
- Intended to reduce moisture inside the residence.
- Fans must be ENERGY STAR compliant.
- Humidistat controls.



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# Chapter 4 – Residential Mandatory Measures

## How to comply

### § 4.506.1 Bathroom Exhaust Fans.

- *Install an whole house ventilation system.*
- *Install ENERGY STAR fans with humidistat controls in each bathroom.*
- *A bathroom is a room that contains a bathtub or a shower or a combination of the two.*



# Chapter 4 – Residential Mandatory Measures

## § 4.507.1 Openings.

- Requires the openings for whole house exhaust fans to be insulated.



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# Chapter 4 – Residential Mandatory Measures

## How to comply

### § 4.507.1 Openings.

- *Install a whole house fan with insulated louvers.*
- *Install a fan with an insulated cover.*
- *Use a fan with insulated duct connected to penetrations in the conditioned envelope .*

# Chapter 4 – Residential Mandatory Measures

## § 4.507.2 Heating and Air-conditioning System.

- Establishes minimum requirements for heating and air conditioning design.
  - Heat loss and heat gain.
  - Duct system sizing.
  - Equipment selection.
- Allows designers flexibility to design based on local conditions.



# Chapter 4 – Residential Mandatory Measures

## How to comply

### § 4.507.2 Heating and Air-conditioning System.

- *Heat loss and heat gain calculation using software or hand calculations or an equivalent.*
- *Duct system design to ensure adequate air flow is provided to address the heat loss and gain in each area of the home.*
- *Select equipment which will provide the necessary air flow and level of conditioning to satisfy the loads, function within the duct design criteria and within the equipment limitations.*

# **Chapter 4 – Residential Mandatory Measures**

Chapter 7 – Installer and Special Inspector Qualifications

# Chapter 7 – Residential Mandatory Measures

## § 702.1 Installer Training.

- Establishes minimum requirements for heating and air conditioning installers.



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# Chapter 7 – Residential Mandatory Measures

## How to comply

### § 702.1 Installer Training.

- *Certification or training as a HVAC systems installer through a program acceptable to the enforcing agency.*
- *Work is performed under the direct supervision of a person with acceptable training.*
- *Examples are provided.*

# Chapter 7 – Residential Mandatory Measures

## § 702.2 Special Inspection.

- Establishes minimum requirements for third party inspectors acting on behalf of the enforcing agency.
- Similar to structural special inspections.



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# Chapter 7 – Residential Mandatory Measures

## How to comply

### § 702.2 Special Inspection.

- *Demonstrate competence to the enforcing agency in the discipline being inspected.*
- *No financial interest in the project.*

# Chapter 8 – Residential Mandatory Measures

- ❑ Sample forms for construction waste management plans
- ❑ Water use worksheets
- ❑ More compliance forms will be added

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# California Department of Housing and Community Development

## Appendix A4 – Residential Voluntary Measures

# California Department of Housing and Community Development

## Appendix A4.

- The appendix was developed in response to numerous stakeholders requesting a **statewide and consistent** option to enhance the level of construction beyond the CALGreen minimum level.
- Tier based which go beyond the code minimum.
- Developed a checklist which can be used which can be used to select and manage the tiers.
- Included a sample resolution that may be used during the local adoption process.

# California Department of Housing and Community Development

## Tier 1 and Tier 2

### ➤ Scope

- The measures contained in the appendix are not mandatory unless adopted by a city, county, or city and county.
- In order to meet one of the tier levels designers, builders, or property owners are required to incorporate additional green building measures necessary to meet the threshold of each level.

# California Department of Housing and Community Development

## ➤ Prerequisite Measures

➤ Tier 1 and Tier 2 thresholds require compliance with the mandatory provisions of this code and incorporation of the required prerequisite measures listed for Tier 1 and Tier 2.

➤ Prerequisite measures are also identified in the Residential Application Checklist.

➤ Additional prerequisite measures may be included by the enforcing agency to address specific local environmental conditions and may be listed in the Innovative Concepts and Local Environmental Conditions portions of the checklist.

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# California Department of Housing and Community Development

## ➤ Elective Measures

- In addition to the required mandatory minimum and prerequisite measures, Tier 1 and Tier 2 buildings must incorporate a specified number of elective measures.

# California Department of Housing and Community Development

## ➤ Tier 1 Prerequisites:

- Topsoil protection (A4.106.2.3).
- 20% permeable paving (A4.106.4).
- Tier 1 cool roof requirements (A4.106.5).
- Exceed the CEC's 2008 Energy Efficiency Standards by 15%.
- Reduced flow rate for kitchen sink faucets (A4.303.1)
- Tier 1 landscape irrigation reduction (A4.304.4).
- 20% cement reduction (A4.403.2)
- 10% recycled content requirements (A4.405.3)
- 65% reduction in construction waste (A4.408.1)
- 80% resilient flooring systems requirements (A4.504.2)
- Low VOC thermal insulation requirements (A4.504.3)



# California Department of Housing and Community Development

## ➤ Tier 1 Electives:

- Choose at least two (2) Planning and Design elective measures from Division A4.1.
- Choose at least four (4) Energy Efficiency elective measures Division A4.2.
- Choose at least one (1) Water Efficiency and Conservation elective measure from Division A4.3.
- Choose at least two (2) Material Conservation and Resource Efficiency elective measures from Division A4.4.
- Choose least one (1) Environmental Quality elective measure from Division A4.5.

# California Department of Housing and Community Development

## Tier 2

- Note: The measures necessary to achieve Tier 2 status are very stringent. Cities, counties and cities and counties considering adoption of Tier 2 as mandatory should carefully consider the stringency of each measure and ensure that the measures are achievable in their location.

# California Department of Housing and Community Development

## ➤ Tier 2 Prerequisites:

- Topsoil protection for Tier 1 and Tier 2 (A4.106.2.3).
- 30% permeable paving (A4.106.4).
- Tier 2 cool roof requirements (A4.106.5).
- Exceed the CEC's 2008 Energy Efficiency Standards by 30%.
- Reduced flow rate for kitchen sink faucets (A4.303.1)
- Dishwasher requirements in (A4.303.1)
- Tier 2 landscape irrigation reduction (A4.304.4).
- 25% cement reduction (A4.403.2)
- 15% recycled content requirements (A4.405.3)
- 75% reduction in construction waste (A4.408.1)
- 90% resilient flooring systems requirements (A4.504.2)
- Tier 1 and Tier 2 thermal insulation requirements

# California Department of Housing and Community Development

## ➤ Tier 2 Electives:

- Choose at least four (4) Planning and Design elective measures from Division A4.1.
- Choose at least six (6) Energy Efficiency elective measures Division A4.2.
- Choose at least two (2) Water Efficiency and Conservation elective measure from Division A4.3.
- Choose at least four (4) Material Conservation and Resource Efficiency elective measures from Division A4.4.
- Choose least one (1) Environmental Quality elective measure from Division A4.5.

## SECTION A4.6.2

### RESIDENTIAL OCCUPANCIES

#### APPLICATION CHECKLIST

Feature or Measure	Levels Applicant to select elective measures		Verifications Enforcing Agency to specify verification method			
	Mandatory	Prerequisites and electives <sup>1</sup>		Enforcing Agency  <input type="checkbox"/> All	Installer or Designer  <input type="checkbox"/> All	Third party  <input type="checkbox"/> All
		Tier 1	Tier 2			
<b>PLANNING AND DESIGN</b>						
<b>Site Selection</b>						
<b>A4.1.3.1</b> A site which complies with at least one of the following characteristics is selected: 1. An infill site is selected. 2. A greyfield site is selected. 3. An EPA-recognized Brownfield site is selected.		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>Site Preservation</b>						
<b>4.1.4.1</b> A site plan and inventory of the site is developed and used to minimize site disturbance in order preserve desirable existing natural resources and minimize future adverse effects on the proposed structure.	<input checked="" type="checkbox"/>					
<b>A4.1.4.1</b> An individual with oversight responsibility for the project has participated in an educational program promoting environmentally friendly design or development and has provided training or instruction to appropriate entities.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

# California Department of Housing and Community Development

## Future Developments

- Outreach, training and education.
- Implementation and compliance aids.
- CALGreen Guide (2<sup>nd</sup> Printing)



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# California Department of Housing and Community Development

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# California Building Standards Commission

## Chapter 5

### Nonresidential Mandatory Measures

- Planning and Design – Division 5.1
- Energy Efficiency – Division 5.2
- Water Efficiency and Conservation – Division 5.3
- Material Conservation and Resource Efficiency – Division 5.4
- Environmental Quality – Division 5.5



# PLANNING AND DESIGN –

## Chapter 5-Division 5.1

### Site Development

- Storm water soil-loss prevention plan (previously SWPPPs)
  - New projects less than one acre
  - BMP's from SWPPPs 1998
- **2010 SWPPPs is currently required for all projects one acre or more**

# PLANNING AND DESIGN –

## Chapter 5-Division 5.1

### **Site Development** - Erosion and sediment control BMPs

- a. Scheduling construction activity
- b. Preservation of natural features, vegetation and soil
- c. Drainage swales or lined ditches to control stormwater flow
- d. Mulching or hydroseeding to stabilize soils Erosion control covers to protect slopes
- e. Protection of storm drain inlets (gravel bags or catch basin inserts)
- f. Perimeter sediment control (perimeter silt fence, fiber rolls)
- g. Sediment trap or sediment basin to retain sediment on site
- h. Stabilized construction exits
- i. Wind erosion control

# PLANNING AND DESIGN –

## Chapter 5-Division 5.1

### Site Development

- Bicycle parking
  - Short-term bicycle parking
    - 5% of visitor parking capacity
  - Long-term bicycle parking
    - 5% of total parking capacity

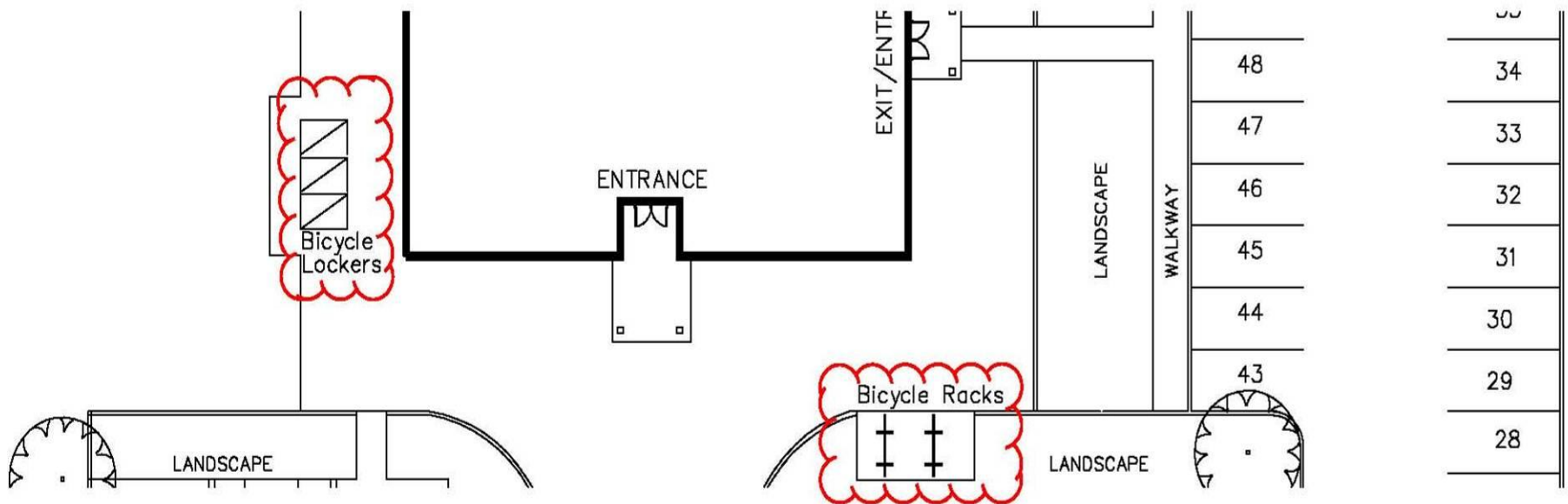


# PLANNING AND DESIGN –

## Chapter 5-Division 5.1

### Site Development

- Bicycle parking



# PLANNING AND DESIGN –

## Chapter 5-Division 5.1

### Site Development

- Designated parking for clean air vehicles
  - ❑ Stall marking for 8% of total parking capacity
  - ❑ Clean air vehicles defined in Section 5.102
  - ❑ Not necessarily preferential location

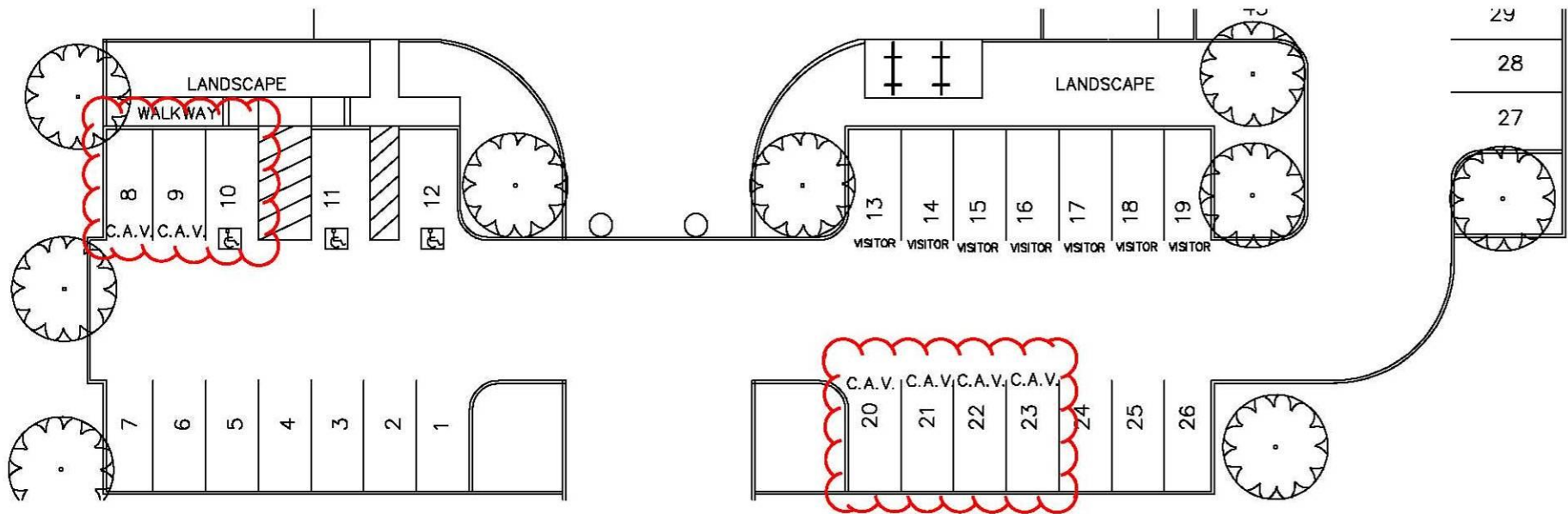


# PLANNING AND DESIGN –

## Chapter 5-Division 5.1

### Site Development

- Designated parking for clean air vehicles



# PLANNING AND DESIGN –

## Chapter 5-Division 5.1



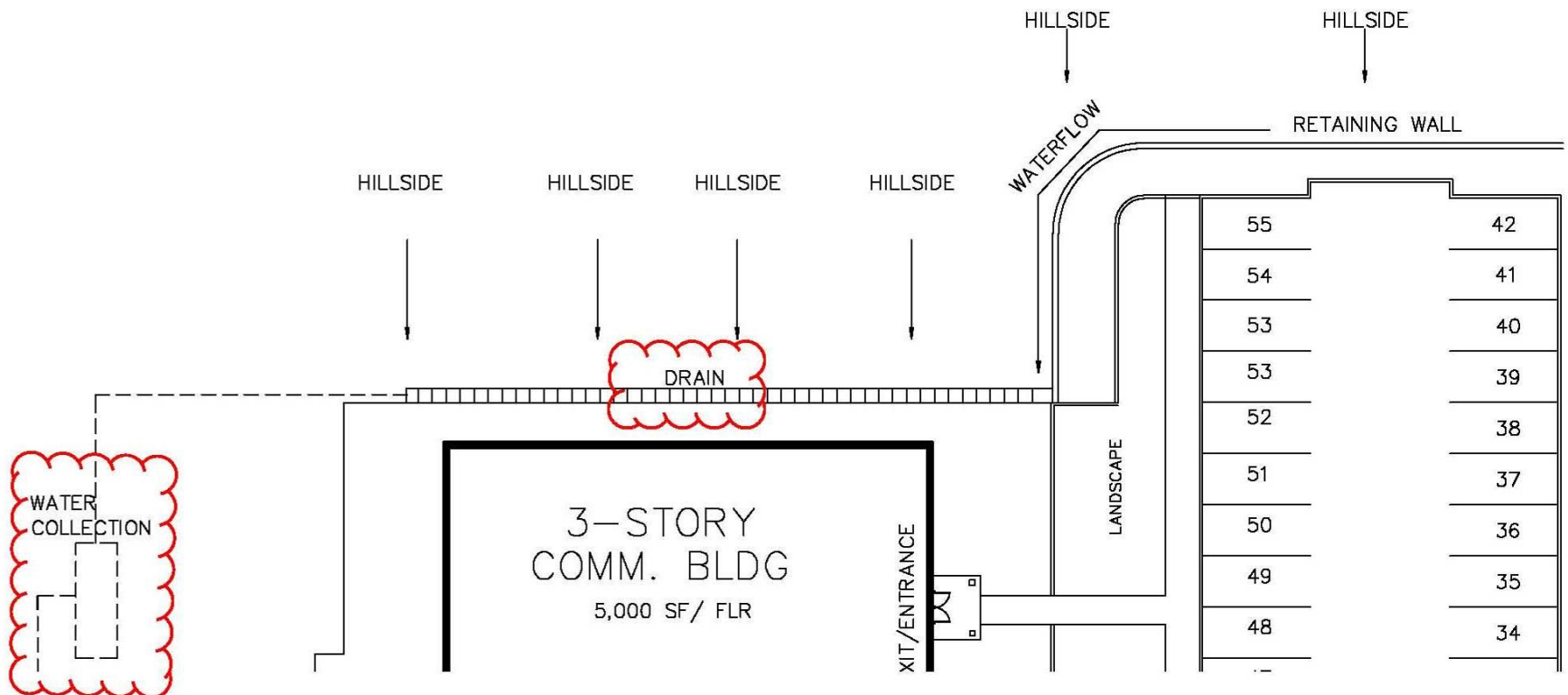
### Site Development (DSA)

- Light pollution reduction
  - Reference the California Energy Code lighting standards
  - Strategies,
    - Shields, interior light containment within source, automatic controls, etc.
  - Exceptions for emergency lighting and security

# PLANNING AND DESIGN –

## Chapter 5-Division 5.1

- Grading & paving (DSA)
  - Keep surface water from entering building
  - Grading shown on construction plans





# **ENERGY EFFICIENCY** - Chapter 5-Division 5.2

## **Mandatory Measures are Regulated by the California Energy Commission (DSA)**

- Mandatory provisions are found in Part 6 of Title 24

# WATER EFFICIENCY AND CONSERVATION

## Chapter 5-Division 5.3

### Indoor Water Use

- Separate water submeters
  - ❑ Buildings in excess of 50,000 square feet where tenants use more than 100 gallons per day
  - ❑ Excess consumption more than 1000 gallons per day



# **WATER EFFICIENCY AND CONSERVATION**

## **Chapter 5-Division 5.3**

### **Indoor Water Use (DSA)**

- 20% Savings of potable water
  - Performance or prescriptive standards, using tables 5.303.2.2 or 5.303.2.3
  - Multiple showerheads serving a single shower
- Wastewater reduction of 20%
- Standards for plumbing fixtures and fittings
  - Standards referenced in Table 5.503.6

# WATER EFFICIENCY AND CONSERVATION

## Chapter 5-Division 5.3

### Outdoor Water Use

- Develop a water budget that complies with DWR or local agency water budget for landscapes 2,500 square feet and over
- Irrigation design for landscapes between 1,000 to 2,500 square feet
  - Weather or soil moisture-based irrigation controllers
- Separate submeter for outdoor potable water use for landscape areas between 1,000 & 5,000 square feet
  - Currently required by DWR for areas over 5000 sq. ft.



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# **MATERIAL CONSERVATION AND RESOURCE EFFICIENCY** - Chapter 5-Division 5.4

## **Water Resistance and Moisture Management (DSA)**

- Exterior weather protection currently in Title 24 or by local ordinance
- Design for moisture control
  - Prevent spray from sprinklers on structures
  - Prevent entries and openings from water intrusion

# **MATERIAL CONSERVATION AND RESOURCE EFFICIENCY** - Chapter 5-Division 5.4

## **Construction Waste Reduction, Disposal and Recycling (DSA)**

- Construction waste diversion – establish a waste management plan
- Construction waste management plan (WMP)
  - Documentation (see sample form in Chapter 8)
  - Exception for isolated jobsites
- Construction waste reduction of at least 50%
  - Exception to allow alternate waste reduction method
- 100% of excavated soil and land clearing debris

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# **MATERIAL CONSERVATION AND RESOURCE EFFICIENCY** - Chapter 5-Division 5.4

## **Building Maintenance and Operation**

- Recycling by occupants
  - Provide readily accessible that serve the entire building and are identified for the depositing of recyclable materials
  - Required by law since 1991
  - Sample ordinance at  
CAL Recycle's website



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# **MATERIAL CONSERVATION AND RESOURCE EFFICIENCY** - Chapter 5-Division 5.4

## **Building Maintenance and Operation**

- Commissioning for new buildings 10,000 square feet and over including:
  - ❑ Owner's or Owners Representative's Project Requirements (OPR)
  - ❑ Basis of Design (BOD)
  - ❑ Commissioning plan
  - ❑ Functional performance testing
  - ❑ Documentation and training
    - ❑ Systems manual
    - ❑ Systems operations training
  - ❑ Commissioning report



# **MATERIAL CONSERVATION AND RESOURCE EFFICIENCY** - Chapter 5-Division 5.4

## **Building Maintenance and Operation**

- Verification of compliance
  - ❑ Commissioning plan, including qualifications of commissioning team
  - ❑ Results of performance tests
  - ❑ Commissioning report

# **MATERIAL CONSERVATION AND RESOURCE EFFICIENCY** - Chapter 5-Division 5.4

## **Building Maintenance and Operation**

- Testing and adjusting for new buildings under 10,000 square feet
  - Balancing of HVAC systems
  - Verification of compliance – inspection verifications and reports

# ENVIRONMENTAL QUALITY –

## Chapter 5-Division 5.5

### Fireplaces

- Direct-vent sealed gas fireplaces
- Sealed wood-burning fireplaces
- Wood burning stoves



# ENVIRONMENTAL QUALITY –

## Chapter 5-Division 5.5

### Pollutant Control (DSA)

- Covering of duct openings
- Protection of mechanical equipment during construction



# ENVIRONMENTAL QUALITY –

## Chapter 5-Division 5.5

### Pollutant Control (DSA)

- Finish material pollutant control – low VOC-emitting products
  - ❑ Adhesives and sealants and caulks
  - ❑ Paints and coatings – Air Resources Board standards
    - Aerosol Paints and Coatings
  - ❑ Carpet systems – 100%
    - Carpet cushion and carpet adhesives
  - ❑ Composite wood products – Air Resources Board standards
  - ❑ Resilient flooring – 50% of resilient flooring
  - ❑ Verification of compliance may be record of product data or other methods acceptable to the enforcing agency

# ENVIRONMENTAL QUALITY –

## Chapter 5-Division 5.5

### Pollutant Control

- Air filters at least MERV 8
- Environmental tobacco smoke control – designed outdoor areas for smoking
  - Local ordinance may apply

# ENVIRONMENTAL QUALITY –

## Chapter 5-Division 5.5

### Indoor Moisture Control (DSA)

- Reference Title 24, Part 2, CBC Section 1203 and Chapter 14

### Indoor Air Quality

- Outside air delivery - by California Energy Code, local code, or Title 8, whichever is more restrictive
- Carbon dioxide (CO<sub>2</sub>) monitoring – for buildings with demand control ventilation per the California Energy Code

# ENVIRONMENTAL QUALITY –

## Chapter 5-Division 5.5

### Environmental Comfort

- Acoustical Control based on ASTM E90 and ASTM E413
  - Exterior noise transmission
    - depends on project location
  - Interior sound
    - minimum STC 40 for separations





# California Building Standards Commission

## Appendix A5

- ❑ **Nonresidential Voluntary Measures**
- ❑ Grid Neutral (DSA)
- ❑ Energy Electives (OSHPPD)

# 2010 California Green Building Standards Code

## NONRESIDENTIAL VOLUNTARY MEASURES

### Appendix A5

The measures contained in the appendix are not mandatory unless adopted by a city, county, or city and county. CALGreen Tier 1 and Tier 2 are intended for adoption by cities, counties, and cities and counties to help California meet its goals for greenhouse gas emission reduction. Appendix provisions may also be used voluntarily by designers, builders, and property owners.

# NONRESIDENTIAL VOLUNTARY MEASURES

**To achieve CALGreen Tier 1 or Tier 2, one must comply with the following:**

- Meet all mandatory requirements;
- Exceed 2008 Energy Efficiency Standards by 15% or 30%;
- Employ additional voluntary measures in all the following areas:
  - Parking for clean air vehicles
  - Cool roofs
  - Reduction of indoor and outdoor water use
  - Construction waste diversion
  - Use of materials with recycled content
  - Installation of low-emitting resilient flooring and thermal insulation; and

# NONRESIDENTIAL VOLUNTARY MEASURES

**To achieve CALGreen Tier 1 or Tier 2, one must comply with the following:**

- **Comply with additional elective measures as follows:**
  - ❑ 5 electives for Tier 1
  - ❑ 15 electives for Tier 2
- **Application Checklist**
  - ❑ Mandatory provisions
  - ❑ Provisions required for compliance with tiers

Category	Tier 1	Tier 2
All	Meet all of the provisions of Chapter 5	Meet all of the provisions of Chapter 5
Planning and Design	10% of total spaces	12% of total spaces
	Roof Slope < 2:12 SRI 64 Roof Slope > 2:12 SRI 16	Roof Slope < 2:12 SRI 78 Roof Slope > 2:12 SRI 20
	1 additional Elective from Division A5.1	3 additional Electives from Division A5.1
Energy Efficiency	Exceed 2008 CA Energy Code by 15%	Exceed 2008 CA Energy Code by 30%
Water Efficiency and Conservation	30% Savings	35% Savings
	60% of ETo times the landscape area	55% of ETo times the landscape area
	1 additional Elective from Division A5.3	3 additional Electives from Division A5.3
Material Conservation and Resource Efficiency	At least 65% reduction	At least 80% reduction
	Utilize recycled content materials for 10% of total material cost	Utilize recycled content materials for 15% of total material cost
	1 additional Elective from Division A5.4	3 additional Electives from Division A5.4
Environmental Quality	80% of flooring meets CHPS VOC limits	90% of flooring meets CHPS VOC limits
	Comply with CHPS VOC limits	Install no-added formaldehyde insulation & comply CHPS VOC limits
	1 additional Elective from Division A5.5	3 additional Electives from Division A5.5
Additional Measures	1 Additional Elective from any category	3 Additional Electives from any category

# Section 5.408 and A5.408

→ **5.408.3 Construction waste reduction of at least 50%.** [BSC, DSA-SS] Recycle and/or salvage for reuse a minimum of 50% of the non-hazardous construction and demolition debris, or meet a local construction and demolition waste management ordinance, whichever is more stringent. Calculate the amount of materials diverted by weight or volume, but not by both.

**Exceptions:**

1. Excavated soil and land-clearing debris
2. Alternate waste reduction methods developed by working with local agencies if diversion or recycle facilities capable of compliance with this item do not exist.

**5.408.4 Excavated soil and land clearing debris.** [BSC, DSA-SS] 100% of trees, stumps, rocks and associated vegetation and soils resulting primarily from land clearing shall be reused or recycled. For a phased project, such material may be stockpiled on site until the storage site is developed.

## SECTION A5.408

### CONSTRUCTION WASTE REDUCTION, DISPOSAL, AND RECYCLING

→ **A5.408.3.1 Enhanced construction waste reduction** [BSC]. Divert to recycle or salvage non-hazardous construction and demolition debris generated at the site in compliance with one of the following:

Tier 1 At least a 65% reduction.

Tier 2. At least an 80% reduction.

**A5.408.3.1.1 Verification of compliance.** [BSC] A copy of the completed waste management report shall be provided.

# Application Checklist

DRAFT

APPLICATION CHECKLIST FOR BSC	Mandatory	Voluntary CALGreen Tier 1    CALGreen Tier 2		
<b>CONSTRUCTION WASTE REDUCTION, DISPOSAL AND RECYCLING</b>				
<b>5.408.1 Construction waste diversion.</b> Establish a construction waste management plan or meet local ordinance, whichever is more stringent.	☒			
<b>5.408.2 Construction waste management plan.</b> Submit plan per this section to enforcement authority. <b>5.408.2.1 Documentation.</b> Provide documentation of the waste management plan that meets the requirements listed in section 5.408.2 items 1 thru 4, and the plan is accessible to the enforcement authority. <b>5.408.2.2 Isolated jobsites.</b> The enforcing agency may make exceptions to the requirements of this section when jobsites are located in areas beyond the haul boundaries of the diversion facility.	☒   ☒	☐	☐	
<b>5.408.3 Construction waste.</b> Recycle and/or salvage for reuse a minimum of 50% of non-hazardous construction and demolition debris or meet local ordinance, whichever is more stringent. <b>Exceptions:</b> 1. Excavated soil and land-clearing debris. 2. Alternate waste reduction methods developed by working <b>A5.408.3.1 Enhanced construction waste reduction.</b> Divert to recycle or salvage non-hazardous construction and demolition debris generated at the site in compliance with one of the following: <div style="border: 1px dashed black; padding: 5px; margin-top: 10px;">             Tier 1. At least a 65% reduction.               Tier 2. At least an 80% reduction.           </div> <b>A5.408.3.1.1 Verification of compliance.</b> A copy of the completed waste management report shall be provided. <b>Exceptions:</b> 1. Excavated soil and land-clearing debris. 2. Alternate waste reduction methods developed by working with local agencies if diversion or recycle facilities capable of compliance with this item do not exist.	☒           ☒	☒	☒	

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→ [CALGreen](#) 2010 California Green Building Standards (CALGreen) Code. [\[PDF\]](#), or link to the [CALGreen](#) page]. Effective on January 1, 2011.

→ [New!](#) [Guide to the Nonresidential CALGreen Code](#) - First Edition, August 2010

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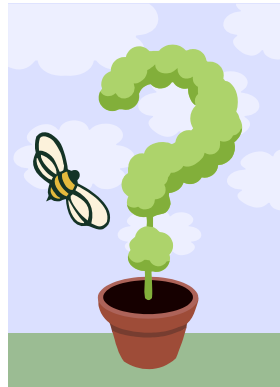
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# CALGreen



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# Questions?



# THANK YOU!